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# A New Ant of the Genus *Metapone* (Hymenoptera: Formicidae) from Sabah, Borneo

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**Abstract.** A new ant species, *Metapone quadridentata,* is described based on workers and a queen from a single colony collected in Poring, Sabah (East Malaysia), Borneo. It is distinguished from the known species of the genus by the dentition of mandibles, the shape of clypeal lobe, etc. The mature larva is described for the first time for this genus.

**Key words**: Formicidae, *Metapone,* new species, mature larva, Borneo.

## Introduction

The myrmicine ant genus *Metapone* was created for *M. greeni* Forel by Forel (1911), and currently consists of 16 valid species distributed in the Oriental, Indo-Australian and Malagasy Regions (Bolton, 1995). The first Bornean species *M. hewitti* was described by Wheeler (1919a) from Kuching, Sarawak, solely based on the male sex. This is the only record of this genus from Borneo.

Descriptions of immature larvae of *M. greeni* by Forel (1911) and Emery (1912) have hitherto been the only accounts for the larva of this genus (cited also by Wheeler (1919a), and Wheeler & Wheeler (1953)).

In the course of my taxonomic study on Bornean ants I collected workers, a queen and mature larvae of a *Metapone* species from a nest in rotten fallen wood in a riverside forest which was located in Poring, Sabah (East Malaysia). In addition, I received a worker of the same species collected in the same locality by Mr. Toru Kikuta of Hokkaido University.

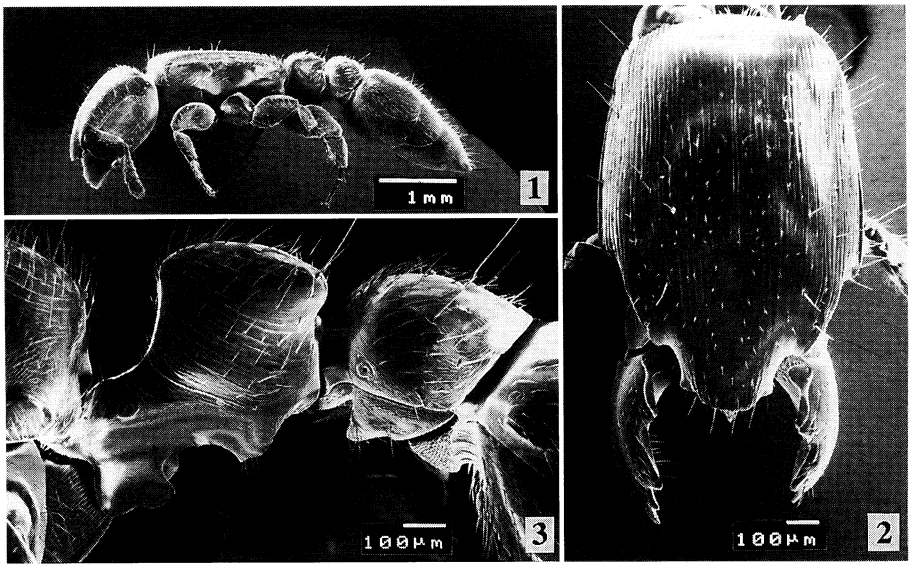
There is a possibility that it represents the female sex of *M. hewitti* for which only male sex is known. However, I will describe it as a new species, since the chance of getting additional material including males of this extremely rare ant in the near future would be minimal. In this paper the workers, queen and mature larva are described for this new species.

## Description

***Metapone quadridentata* sp. nov.**
(Figs. 1–3)

*Worker.* Measurement for each body part of the holotype is given, with the range for all the examined workers in brackets.

Total body length (TL) 7.4 mm [4.9–8.3 mm]; head length excluding mandibles (HL) 1.68 mm [1.11–1.91 mm]; head width (HW) 1.19 mm [0.76–1.33 mm]; head height just in front of eye (HH) 1.11 mm [0.71–1.22 mm]; clypeal length (CL) 0.61 mm [0.43–0.68 mm]; dorsal length of alitrunk excluding anterior and posterior declivities (AL) 2.10 mm [1.30–2.44 mm]; dorsal length of promesonotum excluding anterior declivity (PML) 1.03 mm [0.63–1.26 mm]; dorsal width of promesonotum excluding mesothoracic spiracles (PMW) 0.91 mm [0.55–1.07 mm]; dorsal length of propodeum excluding posterior declivity (PDL) 1.02 mm [0.67–1.18 mm]; propodeal width (PDW) 0.76 mm [0.48–0.88 mm]; petiolar node length (PNL) 0.53 mm [0.33–0.63 mm]; petiolar node width between its anterodorsal corners (APNW) 0.38 mm [0.25–0.47 mm]; petiolar node width between its posterodorsal corners (PPNW) 0.55 mm [0.35–0.68 mm]; petiolar node height including posteroventral welt (PNH) 0.76 mm [0.50–0.88 mm]; postpetiolar length excluding helcium in dorsal view (PPL) 0.53 mm [0.33–0.64 mm]; postpetiolar width (PPW) 0.67 mm [0.42–0.83 mm]; gastral length excluding the sting (GL) 2.43 mm [1.70–2.55 mm]; first




Figs. 1–3. Paratype workers of *Metapone quadridentata* sp. nov. —— 1, Body in profile; 2, head in full face view; 3, petiole and postpetiole in profile.

gastral segment length (G1L) 1.03 mm [0.62–1.18 mm]; first gastral segment width (G1W) 1.19 mm [0.80–1.41 mm].

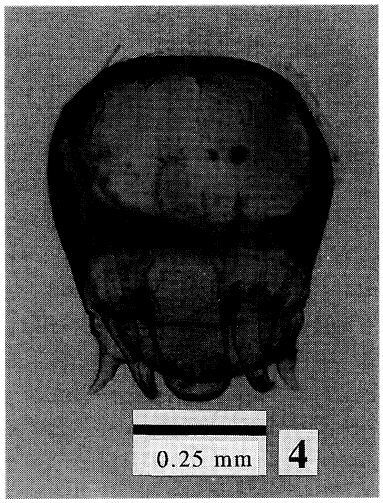
Head in full face view excluding mandibles 1.4–1.5 times as long as broad, subrectangular (Fig. 2), with straight or slightly convex lateral margins; posterior margin slightly concave. Eye small, flat, elongate, 0.23 mm [0.12–0.25 mm] in its longest diameter which is 1.5–1.7 times as long as its shortest diameter. Ocellar pits and ocelli absent. Mandible stout, 4-toothed, with a large basal lobe. Clypeus large, convex posteriorly, with a large median apical lobe. The lobe convex and often feebly sinuate, concave laterally and with angulate preapical corners. Frontal carina extremely flanged to form a deep antennal scrobe under it. Antennal scape flattened and apically much dilated, passing mid-length of head and in frontal view concealed perfectly by frontal carina and antennal scrobe, when laid back in its natural resting position; funiculus with 10 segments, much flattened in the apical 4 segments; 2nd to 6th funicular segments each at least 3 times as broad as long; 7th twice as broad as long; 8th and 9th broader than long; the apical segment 1.4–1.5 times as long as broad, longer than 8th and 9th segments combined.

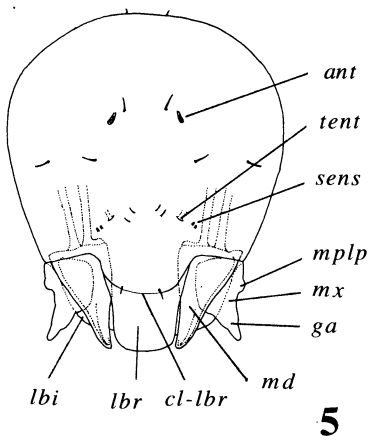
Alitrunk flattened dorsally, in dorsal view subparallel laterally, submarginate dorsolaterally, and distinctly narrower than head. Promesonotal suture absent dorsally; in dorsal view promesonotum, excluding its anterior declivity and protruding mesothoracic spiracles, oblong and 1.1–1.2 times as long as broad. Metanotal groove straight and weak. Propodeum in dorsal view 1.3–1.4 times as long as broad, straight anteriorly, slightly concave posteriorly, slightly convex laterally, narrowed backward through the posterior part, in profile with a slightly concave, subvertical declivity.

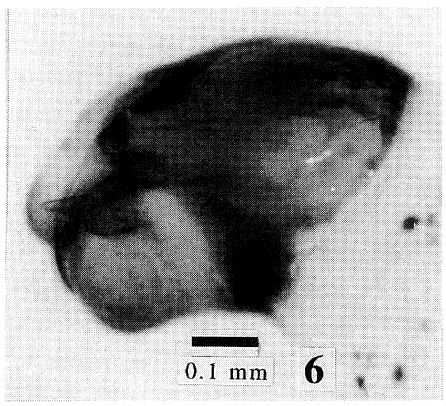
Petiole pedunculate, with a subcuboidal node; the node in dorsal view straight or slightly convex anteriorly, and slightly concave posteriorly, with straight sides which diverge posteriorly, 0.9–1.0 times as long as broad, 0.7–0.8 times as broad as propodeum, in profile (Fig. 3) feebly convex dorsally, truncate anteriorly and posteriorly, with a large, longitudinal, rectangular, translucent subpetioler process on the ventral face, followed by a posteroventral welt which is inverted U-shaped in ventral view. Petiolar spiracle located at the mid-height of petiolar peduncle, just in front of petiolar node. Postpetiole in dorsal view elliptical, 1.2–1.3 times as broad as petiole, 1.2–1.3 times as broad as long when excluding helcium, in profile convex dorsally; in profile the anterior margin of postpetiolar sternite vertical; lower margin of the sternite sloping backward (Fig. 3). Postpetiolar spiracle located at the mid-height of postpetiole just behind the anterior face.

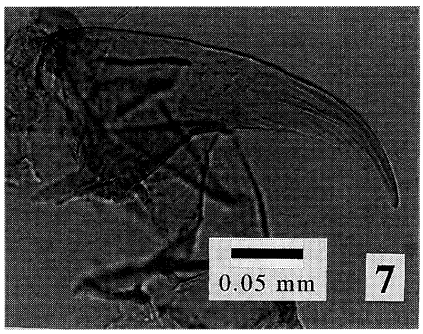
Gaster seen from above elongate and elliptical, truncate basaly and tapering apically, 1.7–1.9 times as broad as postpetiole; only first spiracle visible, which is situated above the mid-height of the 1st segment, just posterior to its anterior face; sting long and stout.

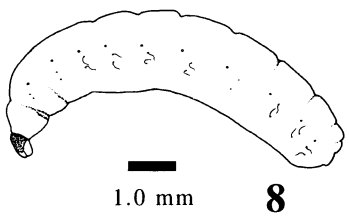
Legs very short; femora very broad; tibiae short and stout; foretibia with a tuft of hairs in front of the large apical pectinate spur, and with a spine behind the spur;

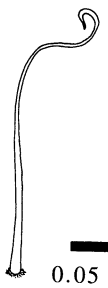



Figs. 4–9. Final instar larvae of *Metapone quadridentata* sp. nov. —— 4, Head in full face view; 5, structure of head, *ant,* antenna, *cl-lbr,* clypeolabral suture, *ga,* galea, *lbi,* labium, *lbr,* labrum, *md,* mandible, *mplp,* maxillary palpus, *mx,* maxilla, *sens,* sensilla, *tent,* tentorial pit; 6, head in profile; 7, mandible (inner surface); 8, body in profile; 9, geniculate hair on trunk.

mid- and hindtibiae each with two spines and welt in front of the apical pectinate spur; foretarsus with many setae over the surface; mid- and hindtarsi with fewer setae than foretarsus; forebasitarsus posteriorly with 3 stout and 1 thin spines at apex; mid- and hindbasitarsi each anteriorly with 4 spines at apex.

Shining; head and alitrunk regularly, densely and longitudinally striate; petiolar node densely and longitudinally striate except for smooth posterodorsal surface; postpetiole dorsally and gaster smooth, with fine, scattered, piligerous punctures. In the smallest workers striae on body surface shallower and weaker than in the larger workers.

Setae yellowish red, long, very sparse, erect or suberect, and almost lacking on thorax. Pubescence yellow, sparse, very distinct on gaster, posterodorsal face of propodeum, and petiolar and postpetiolar dorsa, and scarce in the remainder of body.

Body deep brownish red; scape and legs a little paler. Small workers paler in color than the larger workers.

*Female.* TL 10.1 mm; HL 1.91 mm; HW 1.12 mm; HH 1.16 mm; CL 0.71 mm; AL 3.04 mm; pronotal length 1.16 mm; mesonotal length 1.39 mm; scutum length 1.03 mm; scutum width 1.07 mm; scutellum length 0.40 mm; scutellum width (SCW) 0.78 mm;

PDL 1.12 mm; PDW 0.84 mm; PNL 0.78 mm; APNW 0.32 mm; PPNW 0.61 mm; PNH 0.91 mm; PPL 0.70 mm; PPW 0.84 mm; GL 3.10 mm; G1L 1.33 mm; G1W 1.33 mm.

Head excluding mandibles and eyes approximately 1.7 times as long as broad, sligtly narrowed forward, with almost straight lateral margins and a feebly concave posterior margin, in profile approximately 1.6 times as long as high, slightly convex dorsally. Eye elliptical, situated at the posterior 1/4 length of head, 0.57 mm in its longest diameter which is 1.4 times as long as its shortest diameter, and 0.3 times as long as head length. Ocelli present on vertex; median ocellus situated just in front of the posterior 1/5 length of head (just behind the line through midpoints of eyes). Mandible and clypeus large; frontal carina and antennal scrobe as in worker; frontal groove indistinct. Antenna as in worker.

Alitrunk elongate, in dorsal view subhexagonal, 2.5 times as long as broad excluding the anterior declivity of pronotum, broadest through tegulae where it is broader than head, in profile almost flat dorsally. Humerus of pronotum bluntly angular; mesonotum in dorsal view convex anteriorly and posteriorly, with distinct transscutal articulation; scutum excluding axillae as long as broad; the sutures, separating scutellum from axillae, divergent posteriorly. Metanotum transverse and rather short. Propodeum longer than broad, narrower behind than in front, in dorsal view concave anteriorly, almost straight laterally and almost straight posteriorly, in profile posteriorly with a vertical declivity. In dorsal view the petiolar node 1.3 times as long as broad; the remainder as in worker. Postpetiole elliptical, 1.4 times as broad as petiole; the remainder as in worker. Gaster 1.6 times as broad as postpetiole; the remainder as in worker. Legs as in worker. Sculpture, setae and pubescence as in worker. Body brownish black, darker than in the worker.

*Final instar larvae* (Figs. 4–7).

Total body length (from labium to end of abdomen, through spiracles) 9.0–11.2 mm; cranium length 0.58–0.64 mm (N=15).

Cranium rather sclerotized (colored yellowish brown), approximately as long as broad, with a pair of hairs mesally in front of occipital margin, a pair between antennae, a hair on each gena, a pair on frons between antennae and mandibular bases (all of these hairs simple). Antenna with 2 sensilla. Tentorial pit slit-like, situated near mandibular insertion. Two pairs of short, simple hairs present between tentorial pits; 2 small processes present just distal to tentorial pits. Clypeofrontal suture absent; clypeolabral suture present but indistinct. Clypeus with a pair of short, simple hairs anteriorly. Labrum lobose, slightly broader than inter-mandibular distance at base, slightly narrowed forward; 5–6 small processes scattered on labrum; palate densely covered with rows of spinules. Mandible long, curved downward, pointed apically, without any tooth, far passing the anterior margin of labrum (Fig. 4); its inner surface partially covered by spinules (Fig. 7). Maxilla with a simlpe hair on outer side; galea situated anterodorsally, corniform with a truncated tip, constricted near its midlength and narrower in the apical half than in the remainder, with 2 apical sensilla; maxillary palpus feebly raised as a mound, with 5 sensilla. In frontal view labium subtrapezoidal or subtrilobed, protruded ventrally, broader than distance between maxillary palpi; labial palpus situated on the anterolateral corner, slightly eminent, with 5 sensillae; opening of sericteries situated medially at apex of labium; a short hair present on each side of serictery opening; 2 short hairs situated laterad; 2 pairs of short hairs present ventrally.

Body of myrmecioid shape defined by Wheeler & Wheeler (1976), elongate and rather slender, curved inwardly, without a differentiated neck (Fig. 8); diameter of thorax diminishing gradually from metathorax to the anterior margin of prothorax. Thorax and abdomen with weak inter-segmental lines and dorsally constricted at the line. Spiracles simple in form and uniform in size. Prothorax with 15–18 simple (rarely branched) hairs set in a transverse row; several small processes present between the anterior margin of the segment and the row of hairs. Meso- and metathorax and 1st to 8th abdominal segments each dorsally above spiracles bearing 4 distinct hairs, that are arranged transverselly, and usually straight and simple; lateral face below each spiracle with 2 hairs, that are extremely longer than the other hairs, flangelliform and geniculate apically; ventral face below the geniculate hairs with several simple hairs arranged in a transverse row; these hairs simple but rarely denticulate or branched; additionally each abdominal segment bearing several hairs, or only stubs or sockets, which are located near the anterior and posterior margins of segments; in front of the upper geniculate hairs a small and simple or bifid spinule with its socket present; a small simple spinule with its socket present near the anterolateral border of each segment above spiracle. Ninth abdominal segment bearing a few simple hairs. Anus forming a transverse slit, opening on the terminus of 10th abdominal segment, surrounded by several simple hairs.

*Specimens examined.* Holotype: Worker, Poring

(450–500 m alt.), Sabah, Borneo, Malaysia, 21-XI-1996, K. Eguchi leg., Eg 96-BOR-263.

Paratypes: 11 workers and 1 female (dealated).

31 larvae (8 of them mounted on slides).

All the material above mentioned derived from one and the same colony.

Additional material examined: 1 worker, Poring (600 m alt.), 4-X-1997, T. Kikuta leg., 766A.

The holotype and two paratype workers are deposited in the collection of the Tropical Biology and Conservation Unit, Universiti Malaysia Sabah. One paratype worker is in the collection of the Entomology Section, Kinabalu Park. Two paratype workers, a paratype female and 10 larvae are in the collection of the Museum of Nature and Human Activities, Hyogo. The other paratypes, larvae, and the worker collected by T. Kikuta are temporarily kept in my collection.

*Remarks.* The colony was collected from the galleries of a termite nest in rotten wood. This suggests that this species is termitophilous. Wheeler (1919b) also pointed out a possibility that the genus *Metapone* is termitophagous.

This species is easily distinguished from other *Metapone* species known from Southeast Asia by the following characteristics. In the female of *M. bakeri* Wheeler, 1916 from the Philippines the petiole bears two large blunt angular projections ventrally, and in profile the posterior margin of the petiolar node is strongly concave as arc. In the female of *M. jacobsoni* Crawley, 1924 from Sumatra the clypeus is slightly depressed in the centre of the anterior margin, and the mandible is 5-toothed. In the female of *M. gracilis* Wheeler, 1935 from the Philippines the clypeus terminates in a pair of broad, blunt apical teeth medially, the mandible is 5-toothed, and the petiole bears a triangular lamella ventrally. In the worker of *M. nicobarensis* Tiwari et Jonathan, 1986 from Nicobar Is. the mandible is 5-toothed, and the subpetiolar process is triangular.

All larvae examined in this study were evidently the final instar, as they were almost of the same size and some of them had formed pupal cuticle under larval one. Therefore, it is impossible to directly compare them with immature larvae of *Metapone greeni* described by Forel (1911) and Emery (1912). Long and curved mandibles, lack of any tubercules except hairs on the trunk (Forel, 1911), and possession of hairs that are hooked apically (Emery, 1912), seem to be common to the 2 species.

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### References

Bolton, B. 1995. *A New general Catalogue of the Ants of the World,* 1st ed. Harvard University Press, Cambridge, Massachusetts.

Crawley, W. C. 1924. Ants from Sumatra. With biological notes by Edward Jacobson. *Annals and Magazine of Natural History,* (9) **13**: 380–409.

Emery, C. 1912. Etudes sur les Myrmicinae. *Annales de la Société Entomologique de Belgique,* **56**: 94–105.

Forel, A. 1911. Sur le genre *Metapone* n.g. nouveau groupe des formicides et sur quelques autres formes nouvelles. *Revue Suisse de Zoologie,* **19**: 445–459.

Tiwari, R. N. & Jonathan, J. K. 1986. A new species of *Metapone* Forel from Nicobar Islands (Hymenoptera: Formicidae: Myrmicinae). *Records of the Zoological Survey of India,* **83**: 149–153.

Wheeler, G. C. & Wheeler, J. 1953. The ant larvae of the myrmicine tribes Melissotarsini, Metaponini, Myrmicarini, and Cardiocondylini. *Journal of the Washington Academy of Sciences,* **43**: 185–189.

Wheeler, G. C. & Wheeler, J. 1976. Ant larvae: review and synthesis. *Memoirs of the Entomological Society of Washington,* (7): 1–108.

Wheeler, W. M. 1916. Four new and interesting ants from the mountains of Borneo and Luzon. *Proceedings of the New England Zoological Club,* **6**: 9–18.

Wheeler, W. M. 1919a. The ants of Borneo. *Bulletin of the Museum of Comparative Zoology at Harvard College,* **63**: 43–147.

Wheeler, W. M. 1919b. The ants of the genus *Metapone* Forel. *Annals of the Entomological Society of America,* **12**: 173–191.

Wheeler, W. M. 1935. New ants from the Philippines. *Psyche,* **42**: 38–52.

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